dron, will be very attractive to appropriate Australian ants but that the basis of attraction will not be oleic acid derivatives.

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Smithiozyma gen. nov. (Lipomycetaceae)

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The yeast species described as *Lipomyces japonicus* van der Walt, Smith, Yamada et Nakase differs significantly from the type species, *Lipomyces starkeyi* Lodder et Kreger-van Rij, in terms of ascosporal topography, lipid composition and rRNA base sequence substitution. The species is consequently reclassified in the new, unispecific genus *Smithiozyma* as *Smithiozyma japonica*.

Die gisspesie wat as *Lipomyces japonicus* van der Walt, Smith, Yamada et Nakase beskryf is, toon beduidende verskille met die tipespesie, *Lipomyces starkeyi* Lodder et Kreger-van Rij, ten opsigte van askospoortopografie, lipiedsamestelling en rRNS basissekwensie-substitusie. Die spesie is gevolglik in die nuwe, monotipiese genus *Smithiozyma* as *Smithiozyma japonica*, herklassifeer.

Keywords: Lipomycetaceae, *Smithiozyma japonica*

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Smith *et al.* (1995), by transferring *Lipomyces anomalus* Babjeva et Gorin (1975) to the unispecific genus *Babjevia* van der Walt et Smith, restricted the terricolous yeast genus *Lipomyces* Lodder et Kreger-van Rij (1952) to the type species *L. starkeyi* Lodder et Kreger-van Rij (1952), *L. lipofer* Lodder et Kreger-van Rij ex Slooff (1970), *L. kononenkoae* Nieuwdorp, Bos et Slooff (1974), *L. tetrasporus* Nieuwdorp, Bos et Slooff (1974) and *L. japonicus* van der Walt, Smith, Yamada et Nakase (1989). In terms of its phenotypic and genetic characters, *L. japonicus*, nevertheless, takes an isolated position within the remodelled genus.

Unlike the type species and all other members of the genus, *L. japonicus* is ultrastructurally typified by unusual alveolate to reticulate ascospores which are individually enclosed by a thin, electron-dense, exosporal membrane (van der Walt *et al.* 1989). This ascosporal topography and presence of an exosporal membrane suggest an unusual ascosporogenesis that sets *L. japonicus* apart from all known members of the Lipomycetaceae Novák et Zsolt emend. van der Walt *et al.* (1987).

The singular position of *L. japonicus* within the genus is also manifested genetically. Yamada and Nogawa (1990), probing the molecular phylogeny of the budding lipomycetaceous genera by partial ribosomal ribonucleic acid (rRNA) base sequence analy-

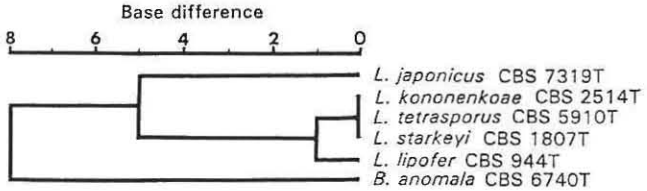

Figure 1 Dendrogram based on the calculated number of base differences in the partial base sequences of the 18S rRNA (positions 1451–1618; 168 bases) of the type strains of the genera *Lipomyces* and *Babjevia*. The dendrogramwas drawn by the simple linkage method. (Data presented by Yamada & Nogawa 1990.)

Table 1 Neutral lipid (NL) content and percentage palmitoleic acid (16:1) in the NL fraction of *L. japonicus* and other members of the genus *Lipomyces*. Data from Jansen van Rensburg (1995) and Jansen van Rensburg *et al.* (1995)

Species	Culture no.	NL content (% m/m)	16:1 content (% m/m of NL)
L. japonicus	CBS 7319T[a]	3.0	11.6
L. starkeyi	CBS 1807T	24.1	4.3
L. kononenkoae	CBS 2514T	26.6	2.5
L. lipofer	CBS 944T	23.1	5.5
L. tetrasporus	CBS 5910T	16.3	4.6

[a]T: type strains held by the Yeast Division of the Centraalbureau voor Schimmelcultures (CBS) in Delft, The Netherlands.

ses of type strains, established that this species showed salient genetic divergence not only from *L. starkeyi* but also from all other members of the remodelled genus, as well as from *B. anomala* (Figures 1 & 2).

The isolated position of *L. japonicus* within *Lipomyces* was more recently also brought forward by its deviant lipid metabolism. Reporting on the distribution of ω3 and ω6 fatty acids associated with the neutral phospho- and glycolipid fractions in the Lipomycetaceae and related anamorphs, Jansen van Rensburg (1995) and Jansen van Rensburg *et al.* (1995) established that *L. japonicus* differed markedly from all other members of the remodelled genus in terms of the neutral lipid (NL) and palmitoleic acid (16:1) content of the NL fraction of the respective type strains. Unlike other members of the genus, *L. japonicus* is not oleaginous, and, moreover, is differentiated by the relatively high percentage 16:1 present in its NL fraction (Table 1).

Given the phenotypic differences and the genetic divergence that distinguish *L. japonicus* from the type species of the genus, it is proposed that it be assigned to:

Smithiozyma *van der der Walt, Kock et Yamada* gen. nov. (Lipomycetaceae)

Coloniae aquosae mucosescentes vel glutinosescentes. Cellulae vegetativae hyalinae incapsulatae, gemmantes multilaterale interdum in basi lata sic septa reducta canalibus plasmadesmalibus formantes. Asci persistentes, plerumque affixi, oriundi aut e protuberantibus aut e conjugationibus cellularum duarum, raro liberi per automixim; 1–4 spori. Ascosporae succinae globosae alveolatae reticulataeque, membrana tenui singulatim circumclusae. Materia amyloidea formans. Imidazolo pro fonte nitrogeni utens. Ubiquinonum majus: Q9.

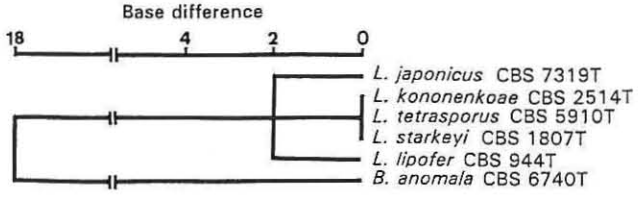

Figure 2 Dendrogram based on the calculated number of base differences in the partibal base sequences of the 26S rRNA (positions 1611–1835; 225 bases) of the type strains of the genera *Lipomyces* and *Babjevia*. The dendrogram was drawn by the simple linkage method. (Data presented by Yamada & Nogawa 1990.)

Specis typica: *Smithiozyma japonica* (van der Walt, Smith, Yamada et Nakase) van der Walt, Kock et Yamada.

Specimen generitypicum: No. PREM 49302 in herbario mycologico Instituti Investigationis Custodiaque Plantarum, Pretorias in Africa australis.

Colonies watery, becoming mucoid to glutinous. Vegetative cells hyaline, encapsulated, budding multilaterally, occasionally on broad base when forming reduced septa with plasmodesmal canals. Asci persistent, usually attached, arising from protuberances, or by conjugation of two cells, rarely free by automixis; 1–4 spored. Ascospores amber-coloured, globose, alveolate to reticulate, singly enclosed by a thin membrane. Amyloid material formed. Imidazole utilized as sole source of nitrogen. Major ubiquinone: Q9.

Type species: *Smithiozyma japonica* (van der Walt, Smith, Yamada et Nakase) van der Walt, Kock et Yamada comb. nov.

Basionym: *Lipomyces japonicus* van der Walt, Smith, Yamada et Nakase in Syst. appl. Microbiol. 11: 302, 1989.

Generic type specimen: No. PREM 49302, deposited in the Herbarium for Fungi of the Research Institute for Plant Protection, Pretoria, South Africa.

The generic name honours M.Th. Smith for her contributions to the systematics of the Lipomycetaceae.

Smithiozyma japonica appears to be widely distributed, with one isolate known from Japan and two from southern Africa. The species is, however, not common, and was recovered from only two out of 60 southern African soil samples (Jansen van Rensburg *et al.* 1992).

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